

WHAT IS CLAIMED IS:

1. A method of making a calcined kaolin, comprising:
 - (a) providing a hydrous kaolin;
 - (b) subjecting the hydrous kaolin to enhanced magnetic separation;
 - (c) heating the hydrous kaolin to a temperature ranging from about 500°C to about 1200°C for a time sufficient to at least partially dehydroxylate the hydrous kaolin; and
 - (d) obtaining a calcined kaolin having a whiteness defined by a Hunter lab coordinate L value of at least about 96.
2. The method according to claim 1, wherein the calcined kaolin in (d) has a brightness of at least about 90, as measured by a Technibrite TB-1C instrument.
3. The method according to claim 1, wherein the calcined kaolin in (d) has a brightness of at least about 91, as measured by a Technibrite TB-1C instrument.
4. The method according to claim 1, wherein the calcined kaolin in (d) has a Hunter lab coordinate L value of at least about 97.
5. The method according to claim 1, wherein the hydrous kaolin in (b) is present in an aqueous slurry.
6. The method according to claim 5, wherein the slurry comprises a magnet enhancer reagent.

7. The method according to claim 6, wherein the magnet enhancer reagent comprises at least one magnetic oxide chosen from metal oxides and mixed metal oxides.

8. The method according to claim 6, wherein the magnet enhancer reagent comprises a metal oxide coated with a surface active agent.

9. The method according to claim 6, wherein the magnet enhancer reagent comprises an iron oxide coated with a surface active agent.

10. The method according to claim 6, wherein the magnet enhancer reagent is shear-stable when subjected to a rotor device that can maintain a rotor blade tip speed of at least about 50 ft/s.

11. The method according to claim 8, wherein the surface active reagent is present in the magnet enhancer reagent in an amount of about 5% activity.

12. The method according to claim 1, wherein the hydrous kaolin is subjected to at least one beneficiation process prior to (c).

13. The method according to claim 12, wherein the at least one process is chosen from blunging, degritting, froth flotation, selective flocculation, and leaching.

14. The method according to claim 1, wherein the heating in (c) occurs for a time sufficient to fully dehydroxylate the hydrous kaolin.

15. The method according to claim 1, wherein the heating in (c) comprises flash calcining.

16. The method according to claim 1, wherein the heating in (c) comprises heating the hydrous kaolin at a temperature ranging from about 800°C to about 1200°C.

17. The method according to claim 1, wherein the heating in (c) comprises heating the hydrous kaolin at a temperature ranging from about 800°C to about 950°C.

18. The method according to claim 1, wherein the heating in (c) comprises heating the hydrous kaolin at a temperature ranging from about 900°C to about 1200°C.

19. The method according to claim 1, wherein the heating in (c) comprises heating the hydrous kaolin at a temperature ranging from about 700°C to about 900°C.

20. The method according to claim 1, wherein the heating in (c) comprises heating the hydrous kaolin at a temperature ranging from about 800°C to about 850°C.

21. The method according to claim 1, wherein the heating in (c) comprises heating the hydrous kaolin at a temperature of at least about 900°C, and the calcined kaolin in (d) has a Hunter lab coordinate L value of at least about 97.5.

22. The method according to claim 1, wherein the heating in (c) comprises heating the hydrous kaolin at a temperature of at least about 900°C, and the calcined kaolin in (d) has a Hunter lab coordinate L value of at least about 98.

23. A calcined kaolin prepared by the process according to claim 1.
24. A composition comprising a kaolin calcined from an enhanced, magnetically separated hydrous kaolin, wherein the calcined kaolin, when dry, has a whiteness defined by a Hunter lab coordinate L value of at least about 96.
25. The composition according to claim 24, wherein the dry calcined kaolin has a brightness of at least about 90, as measured by a Technibrite TB-1C instrument.
26. The composition according to claim 25, wherein the dry calcined kaolin has a brightness of at least about 91, as measured by a Technibrite TB-1C instrument.
27. The composition according to claim 24, wherein the dry calcined kaolin has a whiteness defined by a Hunter lab coordinate L value of at least about 97.
28. The composition according to claim 27, wherein the dry calcined kaolin has a brightness of at least about 91, as measured by a Technibrite TB-1C instrument.
29. The composition according to claim 24, wherein the kaolin comprises fully calcined kaolin.
30. The composition according to claim 24, wherein the kaolin comprises metakaolin.
31. The composition according to claim 24, wherein the kaolin comprises flash calcined kaolin.

- 32. A paint comprising the composition according to claim 24.
- 33. A polymer comprising the composition according to claim 24.
- 34. A ceramic comprising the composition according to claim 24.
- 35. A paper coating comprising the composition according to claim 24.
- 36. A paper coated with the paper coating according to claim 35.
- 37. A filler comprising the composition according to claim 24.
- 38. A filled paper comprising the filler according to claim 37.
- 39. A cementitious product coating comprising the composition according to claim 24.
- 40. A cementitious product coated with the coating according to claim 39.
- 41. A composition comprising a metakaolin having a whiteness defined by a Hunter lab coordinate L value of at least about 96.
- 42. The composition according to claim 41, wherein the metakaolin has a brightness of at least about 91, as measured by a Technibrite TB-1C instrument.
- 43. The composition according to claim 41, wherein the metakaolin has a whiteness defined by a Hunter lab coordinate L value of at least about 97.
- 44. A paint comprising the composition according to claim 41.
- 45. A polymer comprising the composition according to claim 41.
- 46. A ceramic comprising the composition according to claim 41.

- 47. A paper coating comprising the composition according to claim 41.
- 48. A paper coated with the paper coating according to claim 47.
- 49. A filler comprising the composition according to claim 41.
- 50. A filled paper comprising the filler according to claim 49.
- 51. A cementitious product coating comprising the composition according to claim 41.
- 52. A cementitious product coated with the composition comprising the composition according to claim 51.